

## REMARKS

### Summary of Previous and Currently Pending Claims.

In the July 15, 2002 Office Action, claims 9-21 and 23-38 were pending; claims 14-21 and 33-38 were allowed; claims 9, 12, 13, 23, 24, and 27-32 were rejected; and claims 10 and 11 were objected to. Applicants note that claims 25 and 26 were not discussed in the July 15, 2002 Office Action. In light of other comments in the Office Action, Applicants assume that the Examiner will indicate that claims 25 and 26 are allowed and have prepared this response accordingly. If the Examiner believes claims 25 and 26 are not allowed, Applicants will submit possible further amendments.

In this response, Applicants have amended claims 9, 11, 13, 14, 17, 23-28, and 32-34; cancelled claims 10, 15, and 16; and added claims 39-78.

Claims 9, 11-14, 17-21, and 23-78 are pending after entry of this response.

Any amendment or cancellation of a claim is made without prejudice to Applicant pursuing such or a similar claim in another application, and is not to be construed as a dedication to the public of any subject matter.

### Supplemental Information Disclosure Statement

A supplemental information disclosure statement is also submitted herein, under 37 C.F.R. § 1.97.

### Description of and Support for additions and amendments to the claims.

We have amended claim 9 to incorporate the limitation in claim 10 that only one of L and L<sup>1</sup> is a nucleophilic carbene. We have amended claim 23 to incorporate the same limitation.

We have amended claims 9, 14, 23, and 25 to conform the described carbon hybridization to the hybridization shown in the structural formula.

We have amended claims 27, 28, and 32-34 to better clarify the scope of these claims.

We have amended claim 11 to make claim 11 dependent on claim 9 rather than cancelled claim 10.

We have amended claims 13, 17, 24, and 26 to make explicit the structure of the nucleophilic carbene when the "ring [is] optionally aromatic by introduction of a further double bond in the ring." Support for the explicit structure is found at Figure 2A and page 8, line 28 through page 9, line 15.

We have amended claims 14 and 25 to define limitation A<sup>-</sup>. Support for A<sup>-</sup> is found at page 10, lines 17-25.

We have amended claim 17 to correct this claim to depend from claim 14 rather than claim 13.

No new matter has been added by addition of new claims 39-78.

Support for claims 39-50 is found in Figure 1, and in the specifications at page 4, line 7 through page 6, line 4; support for claims 51-58 can be found in the specification at page 9, lines 21-30 and page 9, lines 15-20; support for claims 59-62 can be found in originally filed claims 13, 17, 24, and 26 respectively; support for claims 63-73 can be found in Figures 1 and 2, and in the specification at page 4, line 7 through page 6, line 4; page 6, lines 21-22; Example 4, page 23, line 30 through page 24, line 6; Example 3, page 23, lines 15 through 28; page 8, line 28 through page 9, line 30; and in the originally filed claims; support for claims 74-76 can be found in the specification at page 2, lines 20-23; support for claims 77-78 can be found in originally filed claims 23 and 25.

#### **Response to Rejections under 35 U.S.C. § 112, first paragraph**

Claim 12 is rejected under 35 U.S.C. § 112, first paragraph for lack of enablement. The Applicant respectfully traverses the rejection.

The Examiner alleges that the specification while enabling for X, X<sup>1</sup>, L or L<sup>1</sup> as monodentate ligands is not enabling for a multidentate ligand formed by the bonding of at least two of X, X<sup>1</sup>, L or L<sup>1</sup>. However, it is well known in the art that two unidentate ligands can be

thought of as one bidentate ligand, and the way by which two unidentate ligands are assembled to provide a bidentate ligand is well known in the field. See for example Collman, Megedus, Norton and Finke, Principles and Applications of Organometallic Chemistry, University Science Books, New York 1987, p. 57-234. The present specification supports the formation of a bidentate ligand on page 6, lines 22-27, and page 8, lines 15-18. The present specification thus enables not only unidentate ligands, but also the formation of a bidentate ligand by the bonding of at least two X, X<sup>1</sup>, L or L<sup>1</sup> variables, and Applicant respectfully requests that the Examiner withdraw the rejection.

**Response to Rejections under 35 U.S.C. § 102(a)**

In the July 15, 2002 Office Action, claims 9, 13, 23, 24, and 27-30 were rejected under 35 U.S.C. § 102(a) as being anticipated by a Hermann abstract titled "A Novel Class of Ruthenium Catalysts for Olefin Metathesis."

In the July 15, 2002 Office Action, the Examiner indicated that claim 10 would be allowable if rewritten in independent form.

Applicants have amended claims 9 and 23 to incorporate the limitation of claim 10 that only one of L and L<sup>1</sup> is a nucleophilic carbene. This amendment renders the § 102(a) rejection of claims 9, 13, 23, 24, and 27-30 moot, since all rejected claims depend from amended claims 9 or 23, which claims the Examiner has indicated are allowable.

Since the amendments to claims 9 and 23 render the § 102(a) rejections moot, Applicants have not responded to the substantive rejection over the Hermann reference described in the July 15, 2002 Office Action. Applicants lack of response on this issue is not an admission that the substance of the rejection is correct and is made without prejudice to Applicant addressing such or similar rejections in another application.

### **Response to Rejections under 35 U.S.C. § 103(a)**

In the July 15, 2002 Office Action, claims 31 and 32 were rejected under 35 U.S.C. § 103(a) as being anticipated by a Hermann abstract titled "A Novel Class of Ruthenium Catalysts for Olefin Metathesis."

Claims 31 and 32 depend from claim 9, and Applicants have amended claim 9 to incorporate the limitation of claim 10 that only one of L and L<sup>1</sup> is a nucleophilic carbene. This amendment renders the § 103(a) rejection of claims 31-32 moot, since all rejected claims depend from amended claim 9, which claim the Examiner has indicated is allowable.

Since the amendment to claim 9 renders the § 103(a) rejections moot, Applicants have not responded to the substantive rejection over the Hermann reference described in the July 15, 2002 Office Action. Applicants lack of response on this issue is not an admission that the substance of the rejection is correct and is made without prejudice to Applicant addressing such or similar rejections in another application.

## CONCLUSION

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 515622000100. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: January 6, 2003

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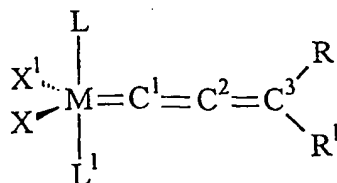
VERSION WITH MARKINGS TO SHOW CHANGES MADE

**In the Claims:**

New claims 39-78 have been added. Please cancel claims 10, 15 and 16.

Please amend claims 9, 11, 13, 14, 17, 23-28, and 32-34 as follows:

9. (Amended) A catalytic complex of the formula:



wherein M is Os or Ru;

$\text{C}^1$ [,] and  $\text{C}^2$  are sp-hybridized carbons and  $\text{C}^3$ [are] is an  $\text{sp}^2$ -hybridized carbon[s], wherein either or both of  $\text{C}^1$  and  $\text{C}^2$  are optionally absent;

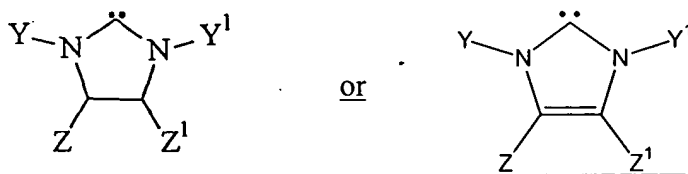
R and  $\text{R}^1$  are independently selected from the group consisting of hydrogen,  $\text{C}_1$ - $\text{C}_{20}$  alkyl,  $\text{C}_2$ - $\text{C}_{20}$  alkenyl,  $\text{C}_2$ - $\text{C}_{20}$  alkynyl,  $\text{C}_2$ - $\text{C}_{20}$  alkoxycarbonyl, aryl,  $\text{C}_1$ - $\text{C}_{20}$  carboxylate,  $\text{C}_1$ - $\text{C}_{20}$  alkoxy,  $\text{C}_2$ - $\text{C}_{20}$  alkenyloxy,  $\text{C}_2$ - $\text{C}_{20}$  alkynyloxy, or aryloxy, each R and  $\text{R}^1$  optionally being substituted with  $\text{C}_1$ - $\text{C}_5$  alkyl, halogen,  $\text{C}_1$ - $\text{C}_6$  alkoxy, or with a phenyl group substituted with halogen,  $\text{C}_1$ - $\text{C}_5$  alkyl or  $\text{C}_1$ - $\text{C}_5$  alkoxy;

X and  $\text{X}^1$  are independently selected from the group consisting of anionic ligands; [and]

L [and  $\text{L}^1$  are] is selected from the group consisting of [nucleophilic carbenes,] phosphine, sulfonated phosphine, phosphite, phosphinite, phosphonite, ether, amine, amide, sulfoxide, carbonyl, nitrosyl, pyridine and thioether [, wherein at least one of L or]; and  $\text{L}^1$  is a nucleophilic carbene.

11. (Amended) A catalytic complex according to claim [10] 9, wherein [one of] L [or  $\text{L}^1$ ] is a phosphine.

13. (Amended) A catalytic complex according to claim 9, wherein said nucleophilic carbene is of the formula:



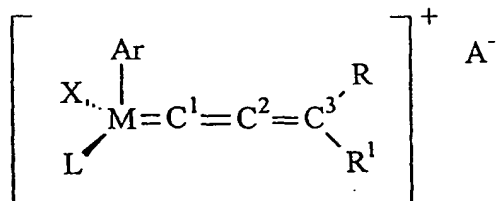
wherein

Y and Y<sup>1</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, C<sub>2</sub>-C<sub>20</sub> alkoxycarbonyl, aryl, C<sub>1</sub>-C<sub>20</sub> carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each Y and Y<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy and;

Z and Z<sup>1</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, C<sub>2</sub>-C<sub>20</sub> alkoxycarbonyl, aryl, C<sub>1</sub>-C<sub>20</sub> carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each Z and Z<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy[.]

[and wherein the ring can be optionally aromatic by introduction of a further double bond in the ring].

14. (Amended) A catalytic complex of the formula:



wherein

$C^1$ [,] and  $C^2$  are sp-hybridized carbons and  $C^3$  [are] is an sp<sup>2</sup>-hybridized carbon[s], wherein either or both of  $C^1$  and  $C^2$  are optionally absent;

M is selected from the group consisting of Os and Ru;

R and  $R^1$  are independently selected from the group consisting of hydrogen,  $C_1$ - $C_{20}$  alkyl,  $C_2$ - $C_{20}$  alkenyl,  $C_2$ - $C_{20}$  alkynyl,  $C_2$ - $C_{20}$  alkoxycarbonyl, aryl,  $C_1$ - $C_{20}$  carboxylate,  $C_1$ - $C_{20}$  alkoxy,  $C_2$ - $C_{20}$  alkenyloxy,  $C_2$ - $C_{20}$  alkynyloxy, or aryloxy, each R and  $R^1$  optionally being substituted with  $C_1$ - $C_5$  alkyl, halogen,  $C_1$ - $C_6$  alkoxy, or with a phenyl group substituted with halogen,  $C_1$ - $C_5$  alkyl or  $C_1$ - $C_5$  alkoxy;

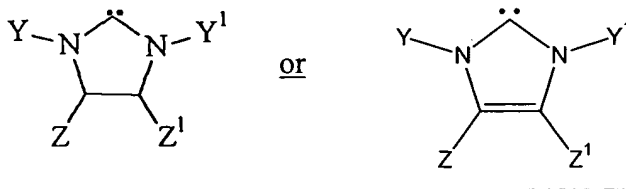
X is an anionic ligand; and

L is a nucleophilic carbene; and

Ar is an aryl substituent, bonded to M by an  $\eta^6$  bond.

A<sup>-</sup> is an inorganic anion or an organic anion.

17. (Amended) A catalytic complex according to claim [13] 14, wherein said nucleophilic carbene is of the formula:



wherein

Y and  $Y^1$  are independently selected from the group consisting of hydrogen,  $C_1$ - $C_{20}$  alkyl,  $C_2$ - $C_{20}$  alkenyl,  $C_2$ - $C_{20}$  alkynyl,  $C_2$ - $C_{20}$  alkoxycarbonyl, aryl,  $C_1$ - $C_{20}$  carboxylate,  $C_1$ - $C_{20}$  alkoxy,  $C_2$ - $C_{20}$  alkenyloxy,  $C_2$ - $C_{20}$  alkynyloxy, or aryloxy, each Y and  $Y^1$  optionally being substituted with  $C_1$ - $C_5$  alkyl, halogen,  $C_1$ - $C_6$  alkoxy, or with a phenyl group substituted with halogen,  $C_1$ - $C_5$  alkyl or  $C_1$ - $C_5$  alkoxy and;

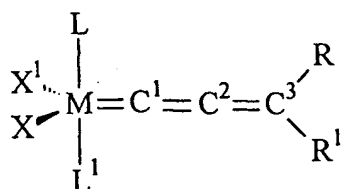
Z and  $Z^1$  are independently selected from the group consisting of hydrogen,  $C_1$ - $C_{20}$  alkyl,  $C_2$ - $C_{20}$  alkenyl,  $C_2$ - $C_{20}$  alkynyl,  $C_2$ - $C_{20}$  alkoxycarbonyl, aryl,  $C_1$ - $C_{20}$



carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each Z and Z<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy[.]

[and wherein the ring can be optionally aromatic by introduction of a further double bond in the ring].

23. (Amended) A method of performing ring closing metathesis, said method comprising contacting a [diterminal] diene with a catalytic complex under conditions appropriate, and for a time sufficient to produce a cyclic alkene, wherein the catalytic complex has the formula:



wherein M is Os or Ru;

C<sup>1</sup>[.] and C<sup>2</sup> are sp-hybridized carbons and C<sup>3</sup> [are] is an sp<sup>2</sup>-hybridized carbon[s], wherein either or both of C<sup>1</sup> and C<sup>2</sup> are optionally absent;

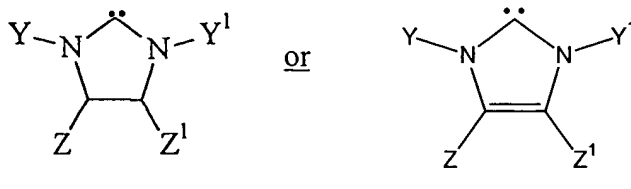
R and R<sup>1</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, C<sub>2</sub>-C<sub>20</sub> alkoxycarbonyl, aryl, C<sub>1</sub>-C<sub>20</sub> carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each R and R<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy;

X and X<sup>1</sup> are independently selected from the group consisting of anionic ligands; [and]

L [and L<sup>1</sup> are] is selected from the group consisting of nucleophilic carbenes, phosphine, sulfonated phosphine, phosphite, phosphinite, phosphonite, ether, amine,

amide, sulfoxide, carbonyl, nitrosyl, pyridine and thioether, [wherein at least one of L or]; and L<sup>1</sup> is a nucleophilic carbene.

24. (Amended) The method of claim 23, wherein the nucleophilic carbene has the formula:



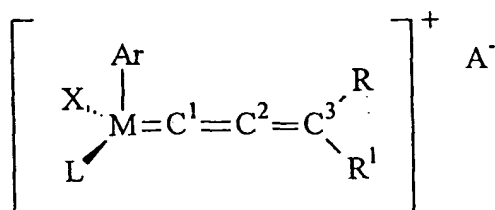
wherein

Y and Y<sup>1</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, C<sub>2</sub>-C<sub>20</sub> alkoxy carbonyl, aryl, C<sub>1</sub>-C<sub>20</sub> carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each Y and Y<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy and;

Z and Z<sup>1</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, C<sub>2</sub>-C<sub>20</sub> alkoxy carbonyl, aryl, C<sub>1</sub>-C<sub>20</sub> carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each Z and Z<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy[.]

[and wherein the ring can be optionally aromatic by introduction of a further double bond in the ring].

25. (Amended) A method of performing ring closing metathesis, said method comprising contacting a [diterminal] diene with a catalytic complex under conditions appropriate, and for a time sufficient to produce a cyclic alkene, wherein the catalytic complex has the formula:



wherein

$\text{C}^1$ [,] and  $\text{C}^2$  are sp-hybridized carbons and  $\text{C}^3$  [are] is an  $\text{sp}^2$ -hybridized carbon[s], wherein either or both of  $\text{C}^1$  and  $\text{C}^2$  are optionally absent;

M is selected from the group consisting of Os and Ru;

R and  $\text{R}^1$  are independently selected from the group consisting of hydrogen,  $\text{C}_1$ - $\text{C}_{20}$  alkyl,  $\text{C}_2$ - $\text{C}_{20}$  alkenyl,  $\text{C}_2$ - $\text{C}_{20}$  alkynyl,  $\text{C}_2$ - $\text{C}_{20}$  alkoxycarbonyl, aryl,  $\text{C}_1$ - $\text{C}_{20}$  carboxylate,  $\text{C}_1$ - $\text{C}_{20}$  alkoxy,  $\text{C}_2$ - $\text{C}_{20}$  alkenyloxy,  $\text{C}_2$ - $\text{C}_{20}$  alkynyloxy, or aryloxy, each R and  $\text{R}^1$  optionally being substituted with  $\text{C}_1$ - $\text{C}_5$  alkyl, halogen,  $\text{C}_1$ - $\text{C}_6$  alkoxy, or with a phenyl group substituted with halogen,  $\text{C}_1$ - $\text{C}_5$  alkyl or  $\text{C}_1$ - $\text{C}_5$  alkoxy;

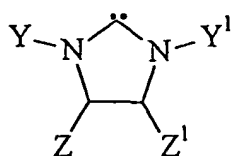
X is an anionic ligand; and

L is a nucleophilic carbene; and

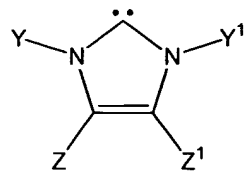
Ar is an aryl substituent, bonded to M by an  $\eta^6$  bond

$\text{A}^-$  is an inorganic anion or an organic anion.

26. (Amended) The method of claim 25, wherein the nucleophilic carbene has the formula:



or



wherein

Y and Y<sup>1</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, C<sub>2</sub>-C<sub>20</sub> alkoxycarbonyl, aryl, C<sub>1</sub>-C<sub>20</sub> carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each Y and Y<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy and;

Z and Z<sup>1</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, C<sub>2</sub>-C<sub>20</sub> alkoxycarbonyl, aryl, C<sub>1</sub>-C<sub>20</sub> carboxylate, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>2</sub>-C<sub>20</sub> alkenyloxy, C<sub>2</sub>-C<sub>20</sub> alkynyloxy, or aryloxy, each Z and Z<sup>1</sup> optionally being substituted with C<sub>1</sub>-C<sub>5</sub> alkyl, halogen, C<sub>1</sub>-C<sub>6</sub> alkoxy, or with a phenyl group substituted with halogen, C<sub>1</sub>-C<sub>5</sub> alkyl or C<sub>1</sub>-C<sub>5</sub> alkoxy[.]

[and wherein the ring can be optionally aromatic by introduction of a further double bond in the ring].

27. (Amended) The catalytic complex according to claim 9, wherein [at least one of the anionic ligands] X and X<sup>1</sup> are independently selected from the group consisting of halide, carboxylate, alkoxy, aryloxy, and alkyl sulfonate.

28. (Amended) The catalytic complex according to claim 27, wherein [at least one of the anionic ligands is] X and X<sup>1</sup> are both chloride.

32. (Amended) The catalytic complex according to claim 9, wherein the complex is linked to a solid support by means of a link between the [at least one of the] nucleophilic carbene[s] and said solid support.

33. (Amended) The catalytic complex according to claim 14, wherein [the anionic ligand] X is selected from the group consisting of halide, carboxylate, alkoxy, aryloxy, and alkyl sulfonate.

34. (Amended) The catalytic complex according to claim 33, wherein [the anionic ligand] X is chloride.